

REMARKS

Reconsideration and allowance of this application, as amended, are respectfully requested.

Claim Status

New claim 40 is supported by the specification at page 17, lines 24-25.

Title

A new title is provided, as requested by the Examiner.

35 USC 112 issues

The claims are amended to address the various 35 USC 112 issues raised by the Examiner.

Prior Art Rejections

The prior art grounds of rejection are respectfully traversed. The amended claims are believed to be patentable over each of the cited references, alone or in any combination thereof.

Claim 24 is not rendered unpatentable by Honda et al (US Patent No. 5,851,643)

The perpendicular magnetic recording medium recited in claim 24 comprises: a nonmagnetic substrate; a first under layer formed on the nonmagnetic substrate and containing titanium; **a second under layer** formed in contact with the first under layer and containing ruthenium; and a magnetic recording layer formed in contact with the second under layer and containing cobalt.

The second under layer is formed so as to be in contact with the first under layer. This structure improves the crystal orientation of the second under layer, and allows the crystal grains in the second under layer to be fine and uniform. In addition, since the magnetic recording layer is formed so as to be in contact with the second under layer having such characteristics as described above, the magnetic recording layer exhibits improved perpendicular orientation. These advantages are not obtained unless **the second under layer is in direct contact with the first under layer and the magnetic recording layer is in direct**

contact with the second under layer. These structural arrangements are NOT taught by the references of record.

The perpendicular magnetic recording medium recited in amended claim 37 comprises a multi-layered structure. This multi-layered structure includes at least two ferromagnetic layers containing cobalt, platinum and oxygen and laminated via one nonmagnetic layer containing ruthenium (the multi-layered structure therefore includes at least three layers). The magnetic recording medium having such a multi-layered structure exhibits further improved perpendicular orientation and perpendicular coercive force.

Honda et al teach a magnetic recording medium which, for example, comprises: an under layer containing titanium, ruthenium, etc.; a first magnetic layer formed on the under layer; a nonmagnetic intermediate layer formed on the first magnetic layer and containing ruthenium, etc.; and a second magnetic layer formed on the nonmagnetic intermediate layer.

However, **Honda et al** do not teach our claimed combination of structures:

- two under layers are provided;
- the second under layer containing ruthenium is formed so as to be in contact with the first under layer containing titanium; and
- the magnetic recording layer is formed so as to be in direct contact with the second under layer.

Claim 37 is not rendered unpatentable by Honda et al (US Patent No. 5,851,643)

In addition to the remarks above, with respect to claim 24, **Honda et al** do not render claim 37 unpatentable. Neither of the magnetic layers of **Honda et al** contains oxygen as required by claim 37.

Futamoto et al (US Patent No. 6,183,893) in view of Honda et al.

The claims are not rendered unpatentable by **Futamoto et al** in view of **Honda et al**.

In **Futamoto et al**, a first under layer is overlaid with a second under layer, and, as described in column 9, lines 38-46, the lattice constant difference between the second under layer and a magnetic recording layer must be not more than 5%. Since the lattice constants of ruthenium and cobalt are 2.71 Å and 2.51 Å ($a = 2.71 \text{ Å}, 2.51 \text{ Å}$), respectively, the lattice constant difference between a second under layer containing ruthenium and a magnetic recording layer containing cobalt could be calculated as follows:

$$(2.71 - 2.51) / 2.71 \times 100 = 7.4 (\%)$$

Since this lattice constant difference is greater than 5%, ruthenium disclosed in Honda is not applicable to the second under layer of **Futamoto et al**.

Combining the teachings of **Honda et al** and **Futamoto et al** do not provide or even suggest our claimed structure, wherein the second under layer containing ruthenium is formed in contact with the first under layer containing titanium.

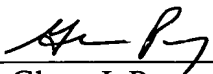
Claims 28 and 39 are not rendered unpatentable by Futamoto et al in view Of Honda et al, further in view of Suzuki et al (US Patent No. 6,335,103).

Suzuki et al disclose a longitudinal magnetic recording medium, and shows that oxygen is added into its longitudinal magnetic recording layer. However, the reference does not show anything further. That is, the reference does not disclose anything regarding a perpendicular magnetic recording layer, let alone perpendicular orientation and the perpendicular coercive force. Since perpendicular magnetic recording and longitudinal magnetic recording entirely differ from each other, it is not possible to substitute the longitudinal magnetic recording layer of Suzuki in place of the perpendicular magnetic recording layer of **Honda et al** or **Futamoto et al**.

In view of the foregoing, the amended claims are believed to be patentable over the references of record.

All outstanding matters having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,
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